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Infrared Matrix Assisted Pulsed Laser Evaporation of Polymeric Films

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Abstract

Polymer processing and polymer thin film production have been of growing interest in the last few years because of their applications in medicine, electronics, optics and biotechnology. Matrix Assisted Pulsed Laser Evaporation (MAPLE) has been studied and used for deposition of thin polymer films with UV and IR lasers. In this work, we have explored how efficiently thin films of polyethylene glycol (PEG) can be grown from a water ice target with 1% PEG dissolved in water which is one of the most convenient solvents. The film surface was studied by optical and scanning electron microscopy (SEM). Information about the chemical composition of the film was obtained by a well-known method, MALDI, and the deposition rate was measured with a quartz crystal microbalance (QCM). The results were compared with those from the literature for irradiation with UV lasers to identify the best deposition conditions for obtaining high quality thin films.